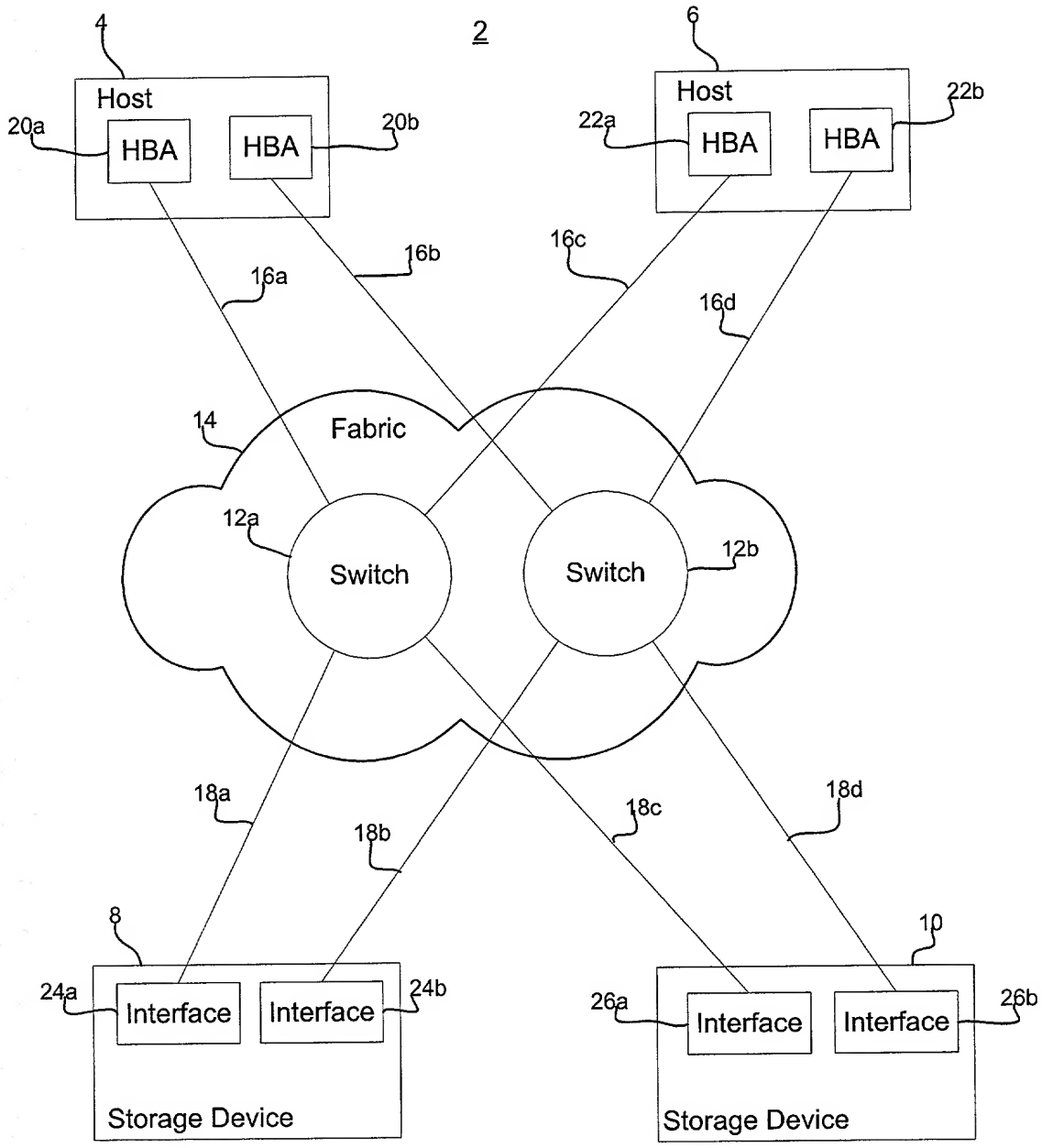
FIG. 1


2
4
Host
20a
HBA
HBA
20b
6
Host
22a
HBA
HBA
22b
16a
16b
16c
16d
14
Fabric
12a
Switch
Switch
12b
18a
18b
18c
18d
8
24a
Interface
Interface
24b
Storage Device
10
26a
Interface
Interface
26b
Storage Device

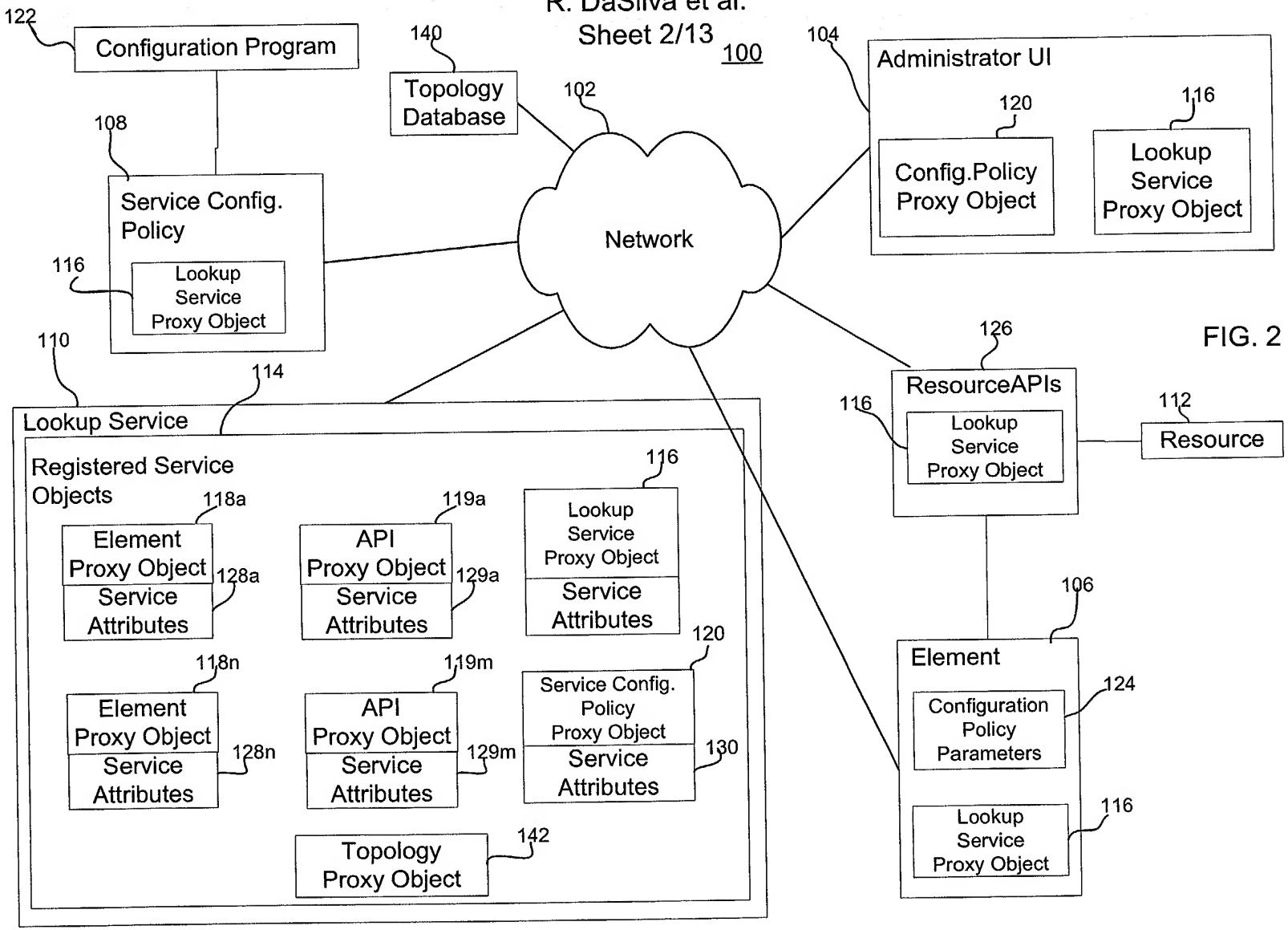

100
122
Configuration Program
140
Topology Database
102
Network
104
Administrator UI
120
Config.Policy Proxy Object
116
Lookup Service Proxy Object
108
Service Config. Policy
116
Lookup Service Proxy Object
110
114
Lookup Service
Registered Service Objects
118a
Element Proxy Object
Service Attributes
128a
119a
API Proxy Object
Service Attributes
129a
116
Lookup Service Proxy Object
Service Attributes
118n
Element Proxy Object
Service Attributes
128n
119m
API Proxy Object
Service Attributes
129m
120
Service Config. Policy Proxy Object
Service Attributes
130
142
Topology Proxy Object
126
ResourceAPIs
116
Lookup Service Proxy Object
112
Resource
106
Element
124
Configuration Policy Parameters
116
Lookup Service Proxy Object

FIG. 2

FIG. 3

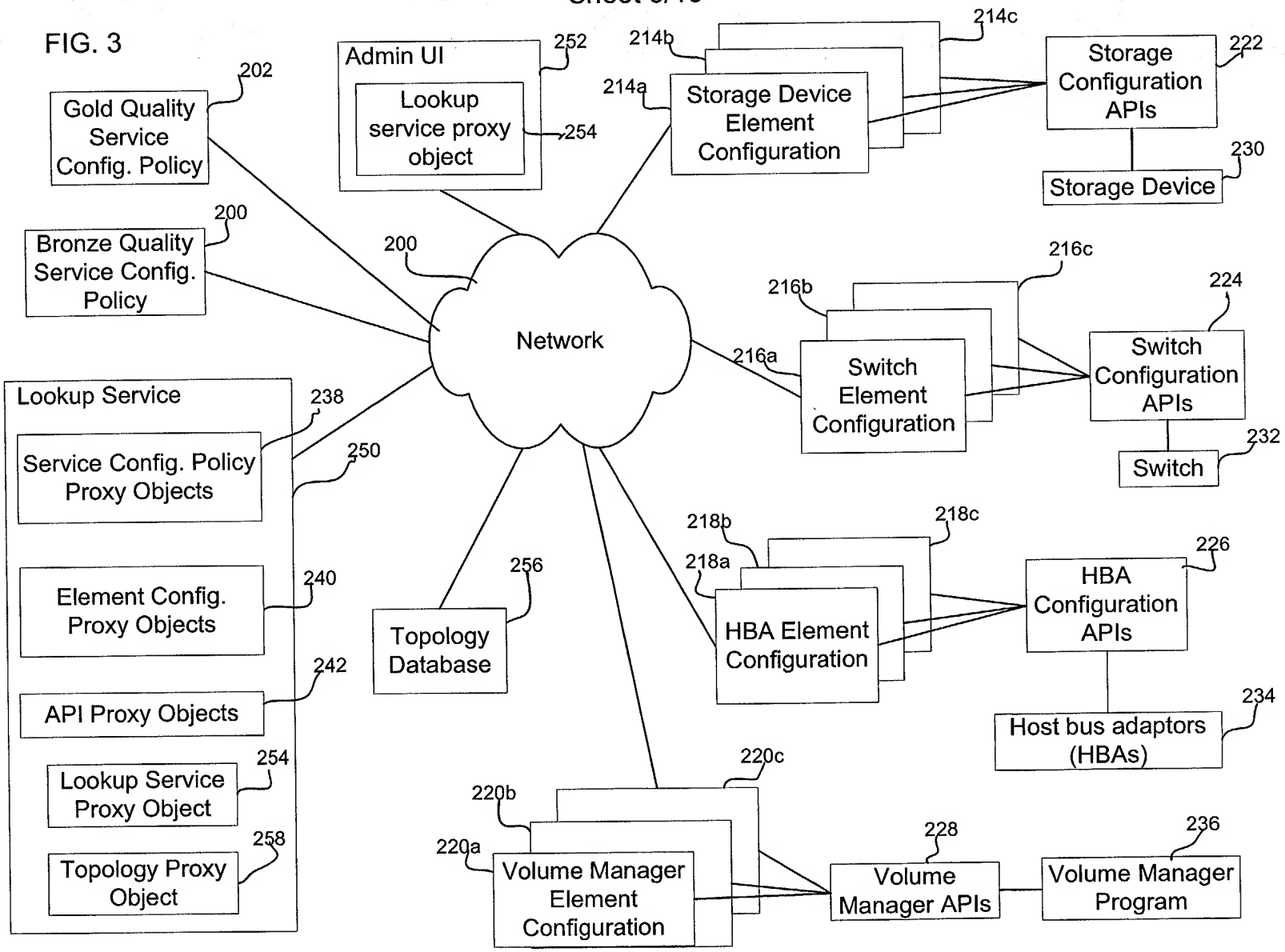

Admin UI
Lookup service proxy object
252
254
Gold Quality Service Config. Policy
202
Bronze Quality Service Config. Policy
200
200
Network
Storage Device Element Configuration
214a
214b
214c
Storage Configuration APIs
222
Storage Device
230
Switch Element Configuration
216a
216b
216c
Switch Configuration APIs
224
Switch
232
Lookup Service
238
Service Config. Policy Proxy Objects
250
Element Config. Proxy Objects
240
API Proxy Objects
242
Lookup Service Proxy Object
254
Topology Proxy Object
258
Topology Database
256
HBA Element Configuration
218a
218b
218c
HBA Configuration APIs
226
Host bus adaptors (HBAs)
234
Volume Manager Element Configuration
220a
220b
220c
Volume Manager APIs
228
Volume Manager Program
236

FIG. 4

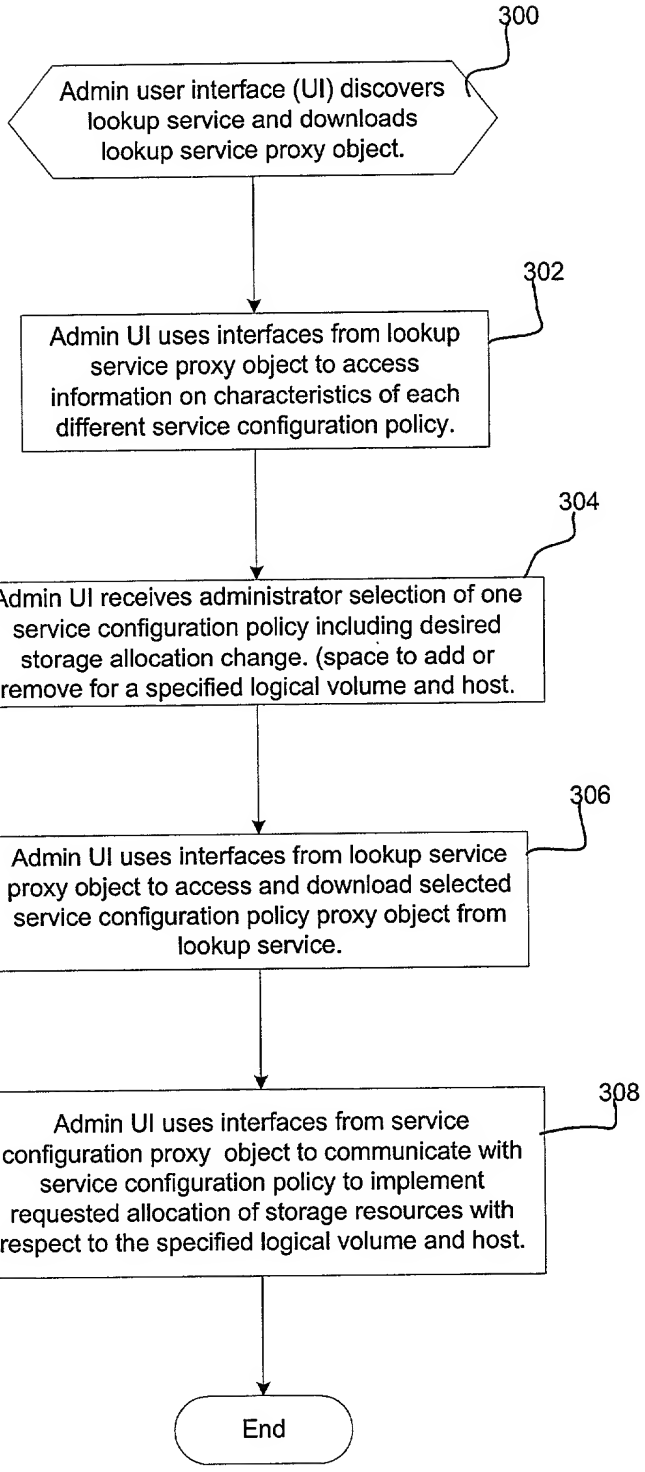

300
Admin user interface (UI) discovers lookup service and downloads lookup service proxy object.
302
Admin UI uses interfaces from lookup service proxy object to access information on characteristics of each different service configuration policy.
304
Admin UI receives administrator selection of one service configuration policy including desired storage allocation change. (space to add or remove for a specified logical volume and host.
306
Admin UI uses interfaces from lookup service proxy object to access and download selected service configuration policy proxy object from lookup service.
308
Admin UI uses interfaces from service configuration proxy object to communicate with service configuration policy to implement requested allocation of storage resources with respect to the specified logical volume and host.
End

FIG. 5

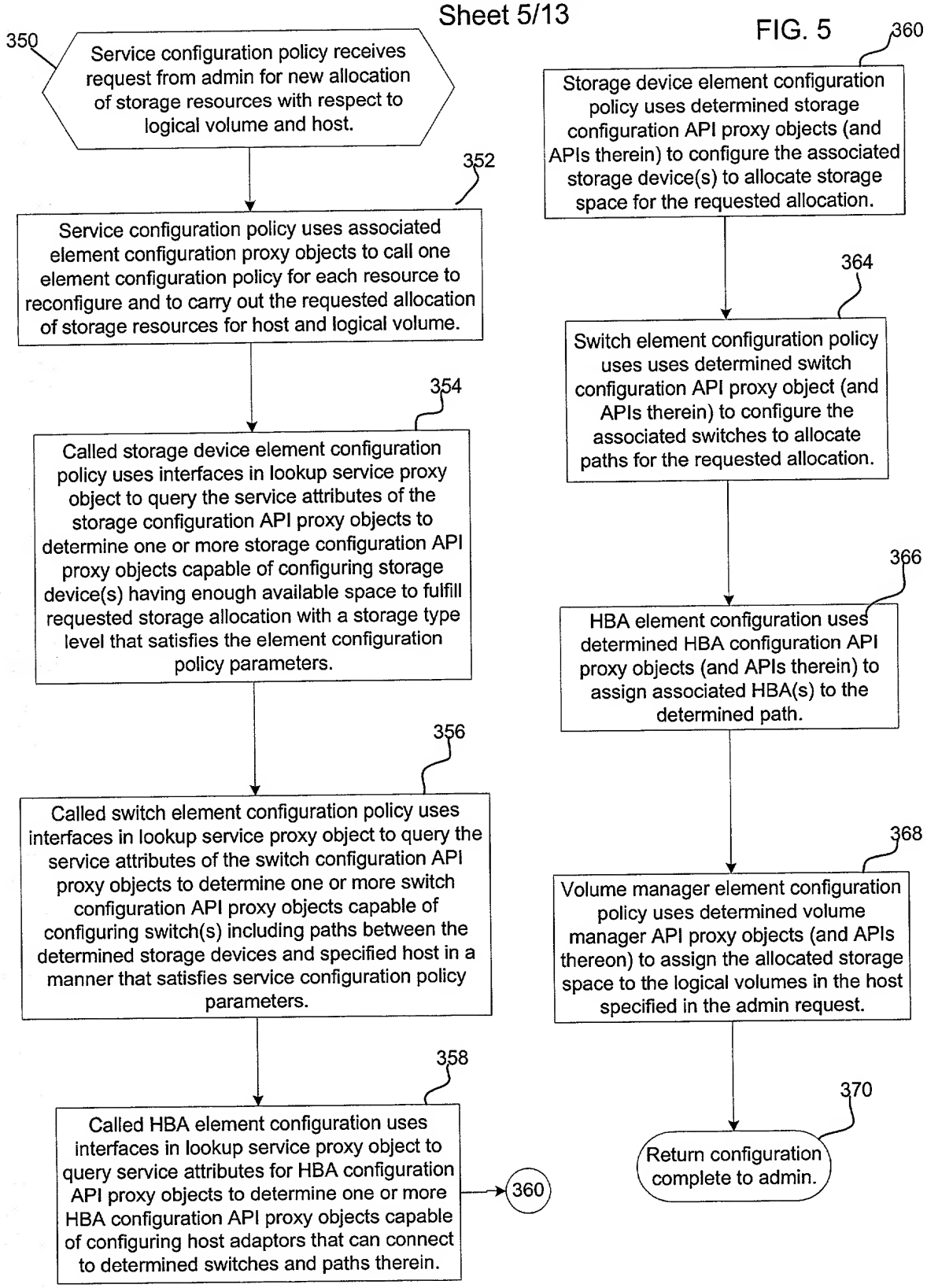


FIG. 6

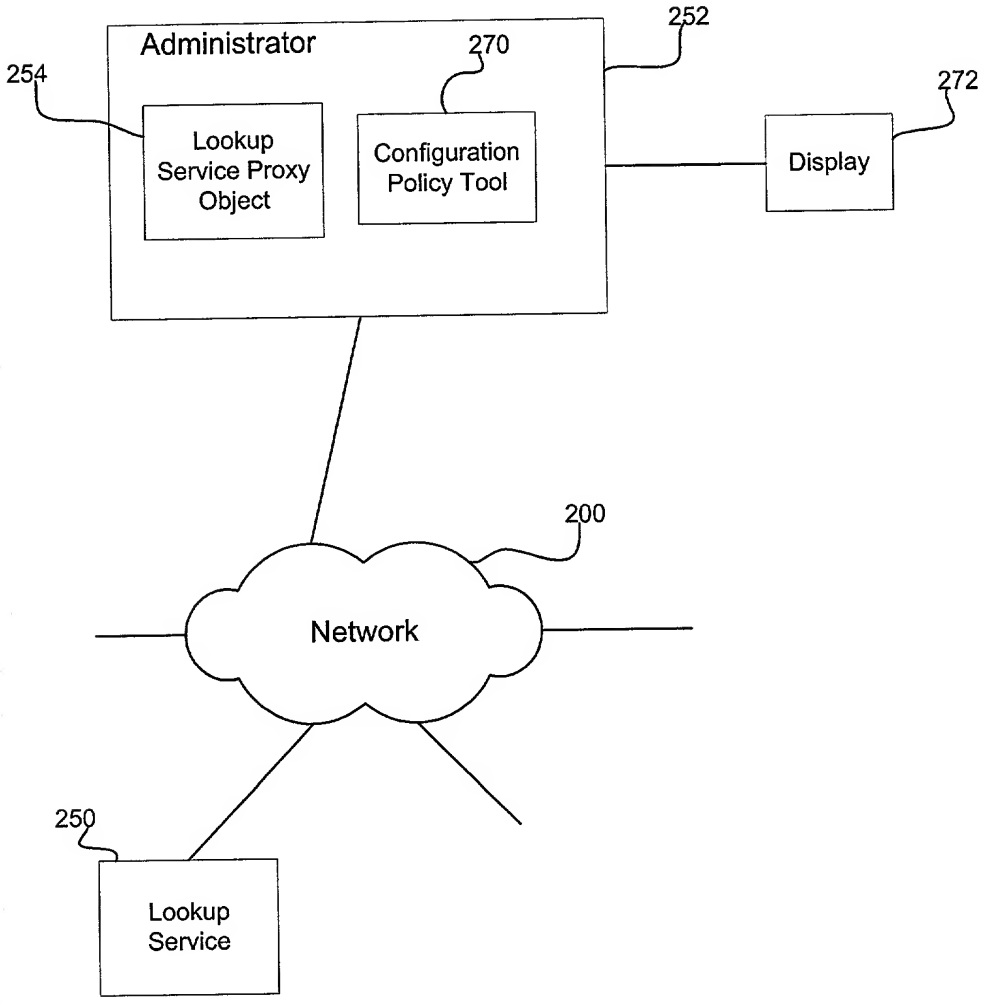


FIG. 7

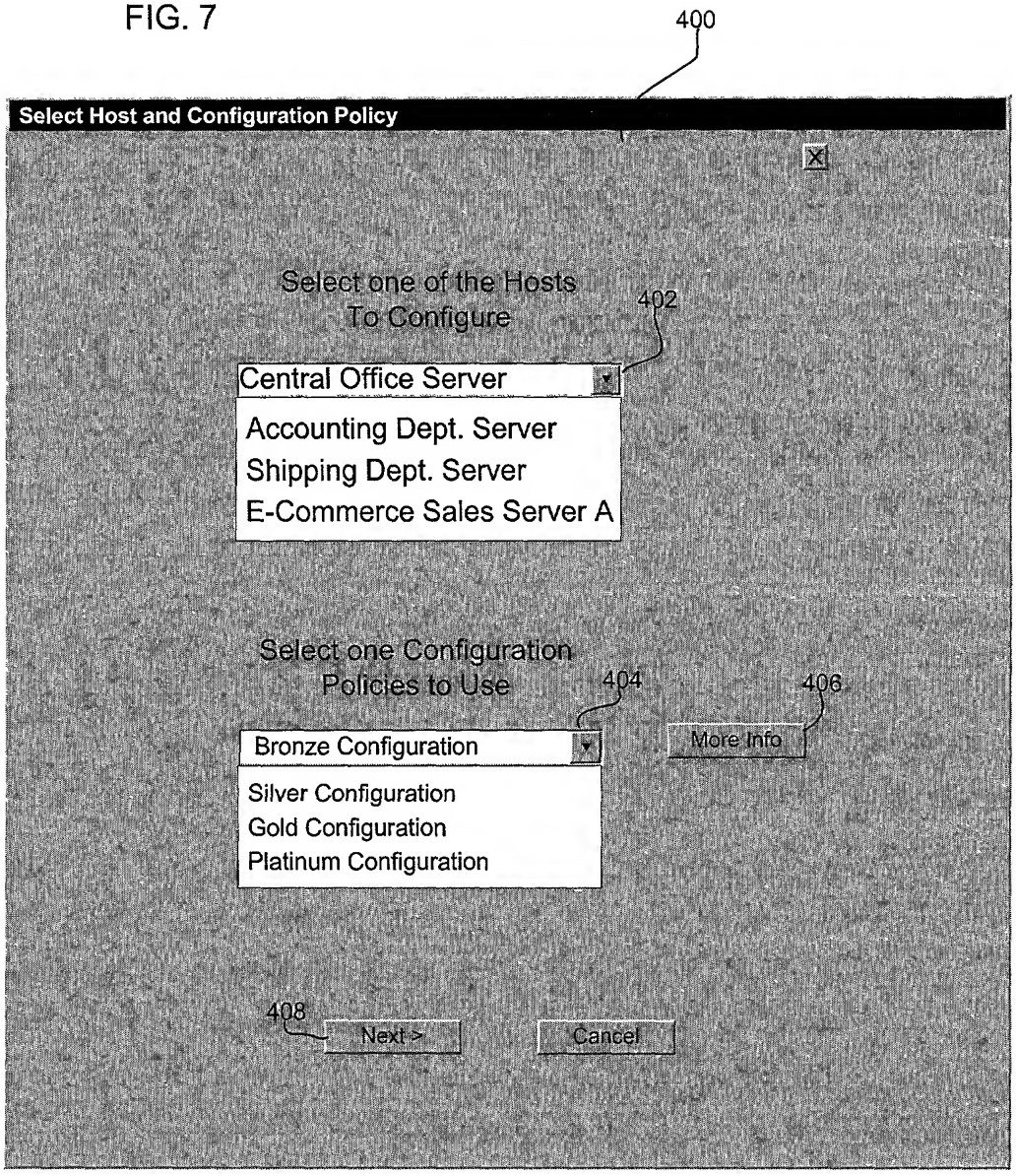

400
Select Host and Configuration Policy
Select one of the Hosts To Configure
402
Central Office Server
Accounting Dept. Server
Shipping Dept. Server
E-Commerce Sales Server A
Select one Configuration Policies to Use
404
406
Bronze Configuration
More Info
Silver Configuration
Gold Configuration
Platinum Configuration
408
Next >
Cancel

FIG. 8

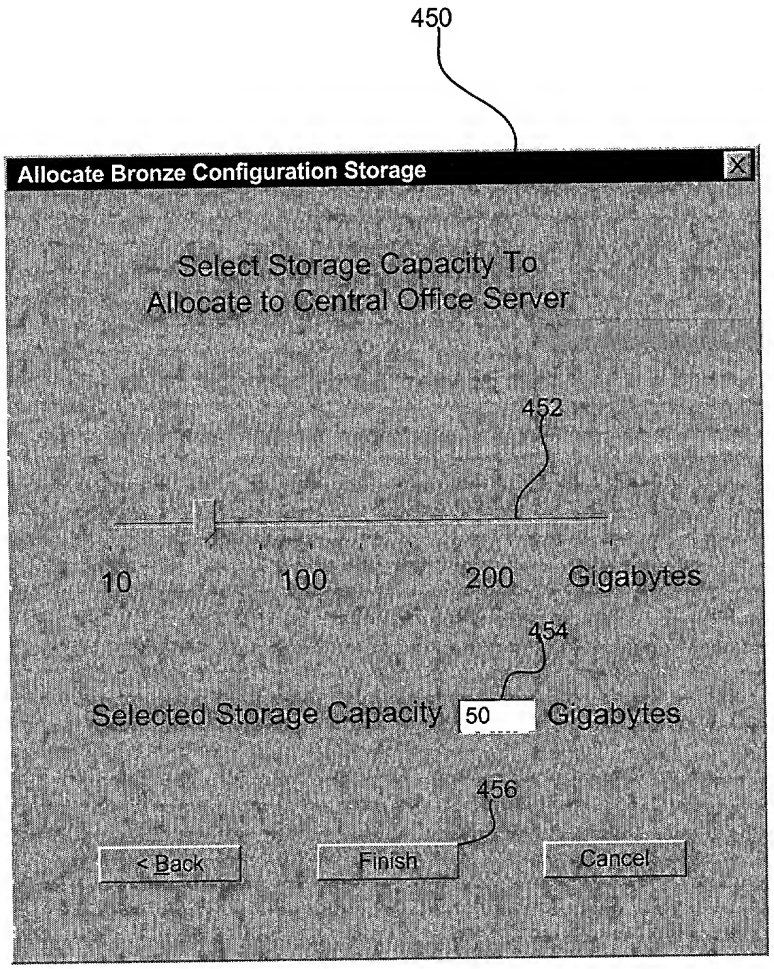

450
Allocate Bronze Configuration Storage
Select Storage Capacity To
Allocate to Central Office Server
452
10
100
200
Gigabytes
454
Selected Storage Capacity
50
Gigabytes
456
< Back
Finish
Cancel

FIG. 9

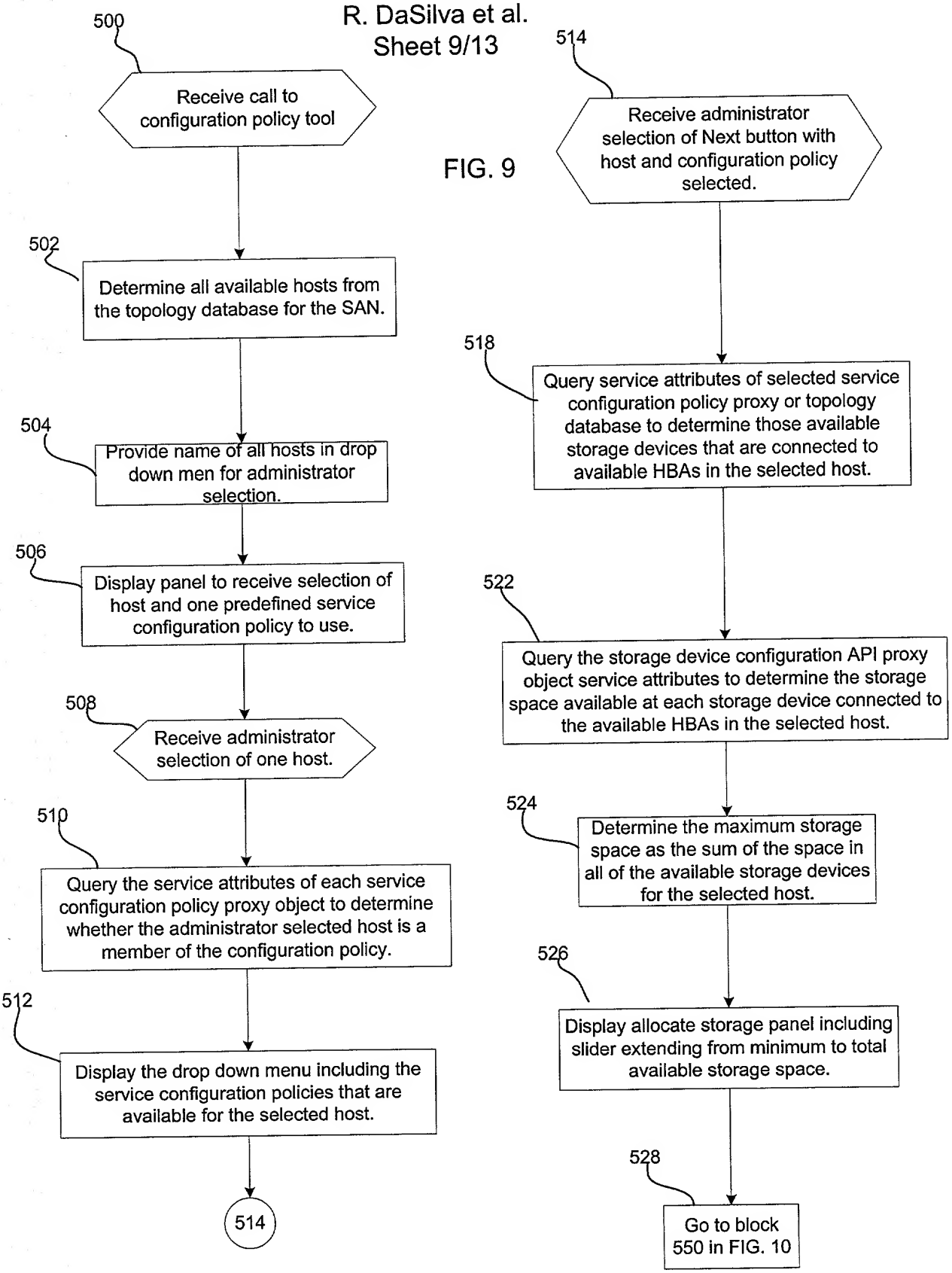

500
Receive call to configuration policy tool
502
Determine all available hosts from the topology database for the SAN.
504
Provide name of all hosts in drop down men for administrator selection.
506
Display panel to receive selection of host and one predefined service configuration policy to use.
508
Receive administrator selection of one host.
510
Query the service attributes of each service configuration policy proxy object to determine whether the administrator selected host is a member of the configuration policy.
512
Display the drop down menu including the service configuration policies that are available for the selected host.
514
514
Receive administrator selection of Next button with host and configuration policy selected.
518
Query service attributes of selected service configuration policy proxy or topology database to determine those available storage devices that are connected to available HBAs in the selected host.
522
Query the storage device configuration API proxy object service attributes to determine the storage space available at each storage device connected to the available HBAs in the selected host.
524
Determine the maximum storage space as the sum of the space in all of the available storage devices for the selected host.
526
Display allocate storage panel including slider extending from minimum to total available storage space.
528
Go to block 550 in FIG. 10

FIG. 10

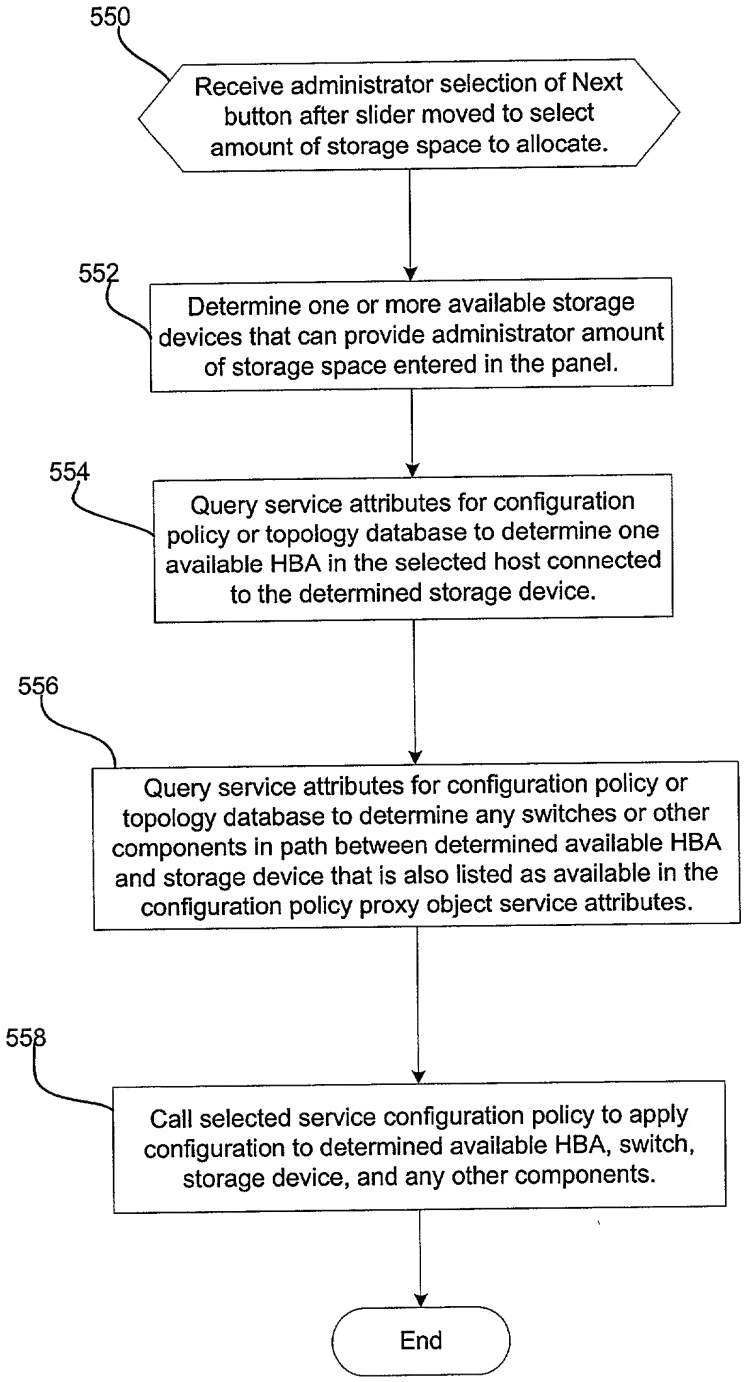

550
Receive administrator selection of Next button after slider moved to select amount of storage space to allocate.
552
Determine one or more available storage devices that can provide administrator amount of storage space entered in the panel.
554
Query service attributes for configuration policy or topology database to determine one available HBA in the selected host connected to the determined storage device.
556
Query service attributes for configuration policy or topology database to determine any switches or other components in path between determined available HBA and storage device that is also listed as available in the configuration policy proxy object service attributes.
558
Call selected service configuration policy to apply configuration to determined available HBA, switch, storage device, and any other components.
End

FIG. 11

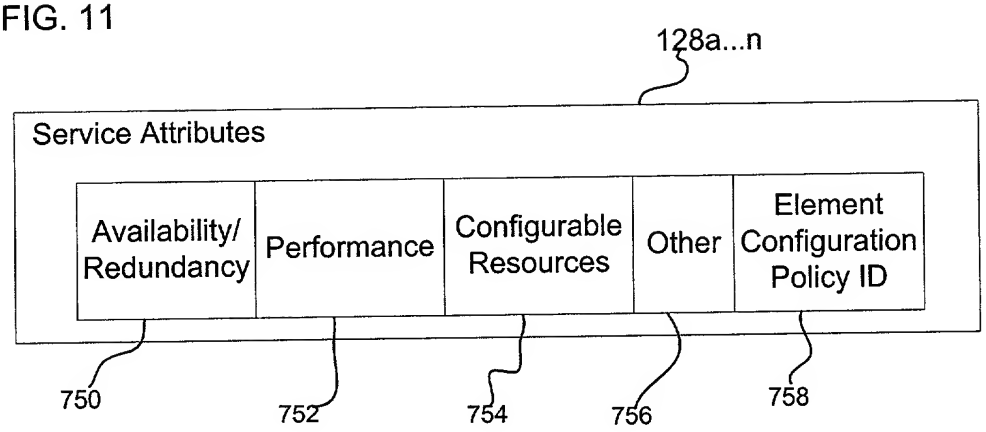

128a...n
Service Attributes
Availability/ Redundancy
Performance
Configurable Resources
Other
Element Configuration Policy ID
750
752
754
756
758

FIG. 12

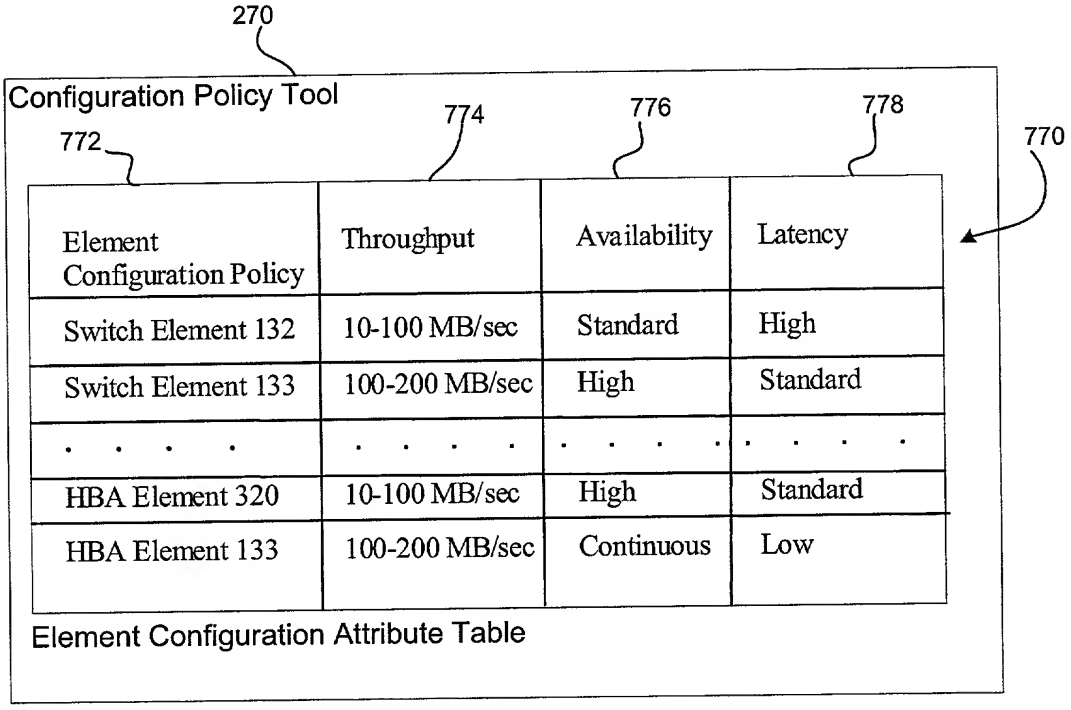
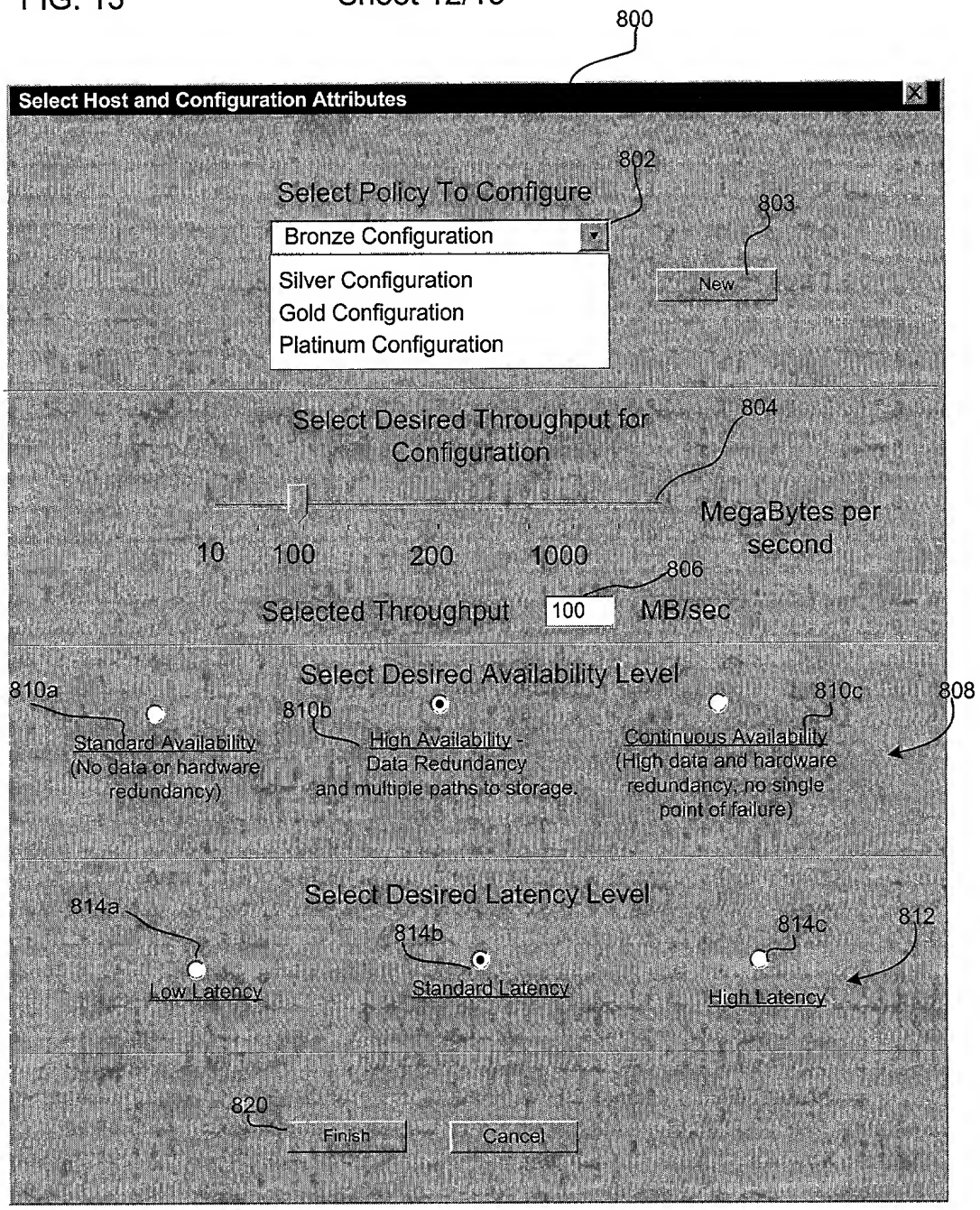

270
Configuration Policy Tool
772
774
776
778
770
Element Configuration Policy
Throughput
Availability
Latency
Switch Element 132
10-100 MB/sec
Standard
High
Switch Element 133
100-200 MB/sec
High
Standard
HBA Element 320
10-100 MB/sec
High
Standard
HBA Element 133
100-200 MB/sec
Continuous
Low
Element Configuration Attribute Table

FIG. 13


800
Select Host and Configuration Attributes
802
Select Policy To Configure
Bronze Configuration
Silver Configuration
Gold Configuration
Platinum Configuration
803
New
804
Select Desired Throughput for Configuration
10
100
200
1000
MegaBytes per second
806
Selected Throughput
100
MB/sec
Select Desired Availability Level
810a
Standard Availability
(No data or hardware redundancy)
810b
High Availability - Data Redundancy and multiple paths to storage.
810c
Continuous Availability
(High data and hardware redundancy, no single point of failure)
808
Select Desired Latency Level
814a
Low Latency
814b
Standard Latency
814c
High Latency
812
820
Finish
Cancel

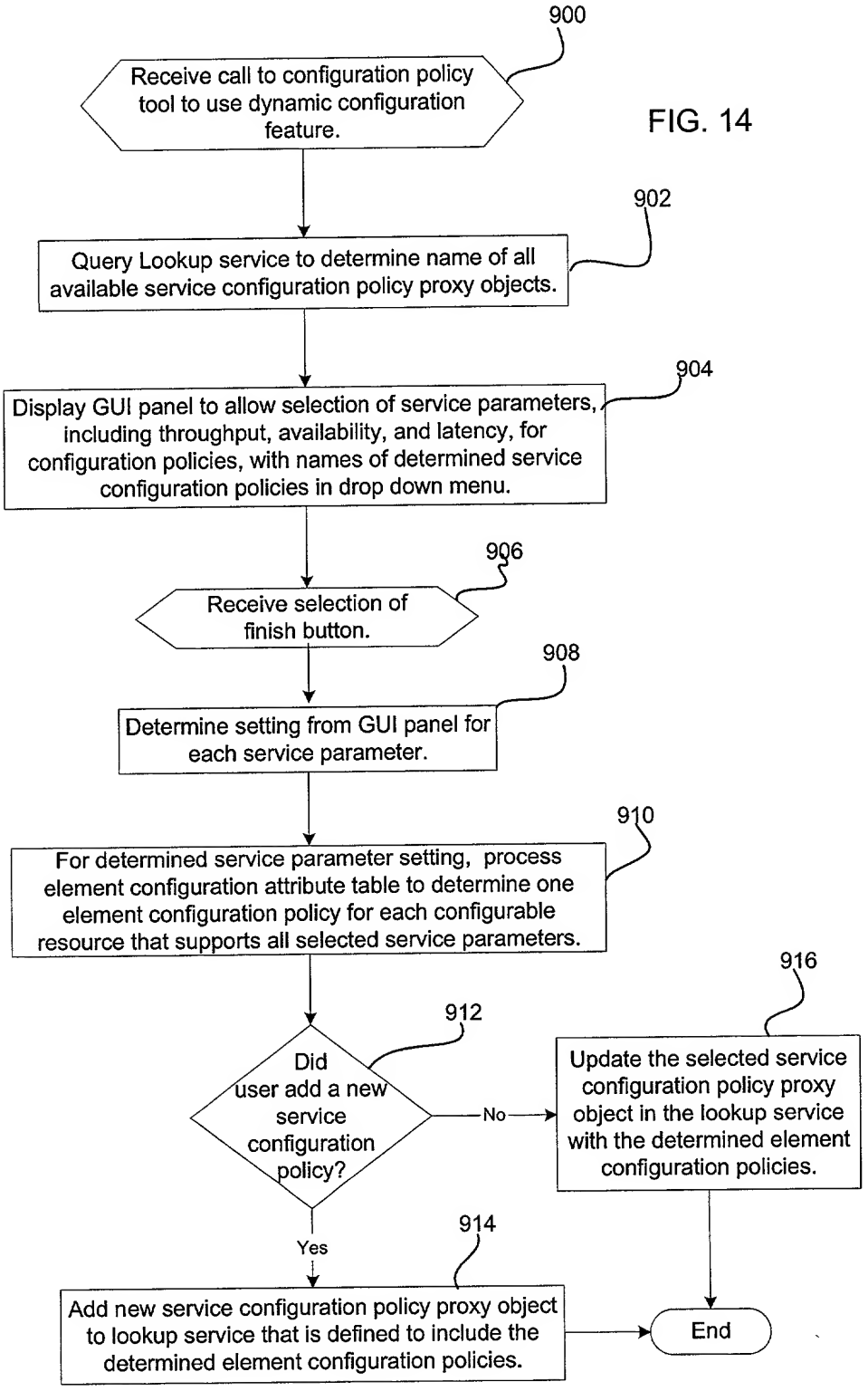


FIG. 14